

Name: \_\_\_\_\_

## Quarter Four Project: RAP

### Research, Analyze, Present!

This project counts as a TEST grade and will be completed (for the most part) OUTSIDE of class time.

**Description:** You (and a partner, if you choose) will research a mathematical discovery, theorem, paradox, formula, conjecture, problem, etc. You will then analyze your choice and present your findings via one of the methods from the Think-Tac-Toe chart.

**\*You MUST choose a mathematical item that is NEW to you, INTERESTS you, and CHALLENGES you! OFF LIMITS: Anything you have directly studied, including the Fibonacci sequence and pi.**

**Suggestions:** Here are suggestions depending on which aspects of math you are interested in. You are *not* limited to these lists. Remember, you can only choose and focus on ONE.

Geometry:	Patterns and other Quirks of Math:	History of Math:	Applications of Algebra:
Magic Hexagon	Pascal's Triangle	The Abacus	Euclidean Algorithm
Hexaflexagons	The Collatz-Syracuse-Ulam Problem	Egyptian Fractions	Digital Cubes
Fractals	Divisibility Rule for Eleven	Euler's Number (e)	Combinations and Permutations
Flexible Polyhedron	Binary Number System	Golden Ratio (phi)	Logarithms
Replicating Polygons	Hexadecimals	Heron's Formula	Vectors
Geometric Constructions	Triangular Number Sequence	Quincux (Galton Board)	Asymptotes
Sphere Packing Problem	Nonograms	Pythagoras' Discovery relating Math to Music	Fractional Exponents

**Note:** This is NOT a project where you research a mathematician or a branch of mathematics and report on it. Re-read the description above and/or ask your teacher for assistance.

## RAP Project: Source Suggestions

### Websites:

1. [www.mathisfun.com](http://www.mathisfun.com): Explains basics of math concepts, good place to start to see if you want to explore a topic more.
2. [www.weusemath.org](http://www.weusemath.org): Provides updates on new discoveries in math, how we can use math in the real world, etc.
3. [www.khanacademy.org](http://www.khanacademy.org): Over 240,000,000 videos explaining a wide range of math concepts.
4. [www.sciencedaily.com](http://www.sciencedaily.com): Search this site to find articles related to math discoveries.
5. [www.mathcats.com](http://www.mathcats.com): This site seems silly, but check out the “math cats explore” link!

\*When in doubt, google your math topic and see what happens!

### Books (You don't have to read the whole book, just find relevant excerpts!)

1. Books by Ian Stewart, especially:  
*How to Cut a Cake: And Other Mathematical Conundrums*  
*Professor Stewart's Cabinet of Mathematical Curiosities*  
*Professor Stewart's Hoard of Mathematical Treasures: Another Drawer from the Cabinet of Curiosities*
2. *Why Do Buses Come in Threes? : the Hidden Mathematics of Everyday Life* by Robert Eastaway
3. *Life by the Numbers* by Keith Devlin
4. *Coincidences, Chaos, and All that Math Jazz: Making Light of Weighty Ideas* by Edward Burger
5. *The Joy of Mathematics* by Theoni Pappas
6. *Fractals, Googols, and other Mathematical Tales* by Theoni Pappas
7. *Mathematics 101: Absolutely Everything that Matters in Mathematics, in 1001 Bite-Sized Explanations* by Richard Elwes

Name: \_\_\_\_\_

## RAP Project: Deadline #1: Proposal

Due: Monday, 4/11 Score: \_\_\_\_/10

You must fill out all parts of this proposal section to meet this deadline.

Name: \_\_\_\_\_

Name of Partner (optional): \_\_\_\_\_

Parent Signature: \_\_\_\_\_

Topic: \_\_\_\_\_

Brief Description of Topic: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Think-Tac-Toe Method of Presentation: \_\_\_\_\_

Sources:  
\*NO WIKIPEDIA!

Required:

1. \_\_\_\_\_

2. \_\_\_\_\_

Optional:

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

Name: \_\_\_\_\_

## RAP Project: Deadline #2: Research and Analysis

Due: Monday, 4/18    Score: \_\_\_\_/10

Topic: \_\_\_\_\_

**What?** (What is your mathematical discovery, theorem, paradox, formula, conjecture, problem? Provide a brief description.)

**Who?** (Is anyone or any group directly associated with this? Explain.)

**When?** (When was this discovered? Are there any other important dates associated with this? Note: a date may be unknown.)

**Where?** (Describe any location(s) associated with your mathematical concept.)

**Why?** (Why was this discovered? Why was someone interested in this? Why are you interested?)

**How?** (How does this work? Here, go into much more detail and explain your mathematical discovery, theorem, paradox, formula, conjecture, problem. Please provide any relevant diagrams, formulas, mathematical work, etc.)

Name: \_\_\_\_\_

## RAP Project: Deadline #3: Final Product

**Due: Monday, 5/2**

On Monday, May 2nd, you will turn in and/or present your final product using one of the choices from the Think-Tac-Toe board that you (and your partner) have NOT used yet this school year. Your final product must meet all of the requirements of the rubric.

PowerPoint	Paper (1 page minimum)	Speech (with prop)
Poem	Skit	Video/Movie
Song	Poster	Booklet

### Requirements for Each Presentation Style:

**It is your responsibility to examine and follow the project requirements for your particular mode of presentation.**

**PowerPoint:** Your PowerPoint must be a minimum of 6 slides. Each slide must contain a picture. All parts of your research and analysis must be present and correct spelling and grammar is required. Creativity is a must! Your PowerPoint must be EMAILED or shared via Google drive (no flash drives).

**Paper:** Your paper must be typed in Times New Roman font, 12 point, double-spaced. Your heading must be four lines only, single spaced (name/date/period/assignment description). Your paper should include all parts of your research and analysis. Spelling and grammar count! ONE PAGE MINIMUM. Your paper must be PRINTED out or EMAILED or shared via Google drive (no flash drives).

**Speech (with prop):** Your speech must be a minimum of 2 minutes and a maximum of 5 minutes. You must present all parts of your research and analysis and you may use notecards to guide you. You should make eye contact with your audience, speak at a pace and volume that can be clearly understood, and there should be evidence that you have practiced your speech. A PROP RELATED TO YOUR WORD PROBLEM IS REQUIRED.

**Poem:** Your poem must be typed in Times New Roman font, 12 point, double-spaced. Your heading must be four lines only, single spaced (name/date/period/assignment description). Your poem should include all parts of your research and analysis with room for creativity. Your poem can be in any form you like, but you need a minimum of three stanzas with a minimum of three lines each. Spelling counts!

**Skit:** Your skit must be a minimum of 2 minutes and a maximum of 5 minutes. You must present all parts of your research and analysis through your skit and you may use notecards to guide you. You should speak at a pace and volume that can be clearly understood, and there should be evidence that you have practiced your skit. **ALTHOUGH YOU MAY USE OTHER STUDENTS IN THE CLASS FOR YOUR SKIT, THESE STUDENTS WILL NOT RECEIVE CREDIT FOR YOUR SKIT AND YOU MUST REHEARSE WITH THEM OUTSIDE OF CLASS TIME.**

**Video/Movie:** Your video/movie must be a minimum of 2 minutes and a maximum of 5 minutes. You must present all parts of your research and analysis through your movie. Creativity is a **MUST**, but the algebra must be clear. Your video/movie **MUST** be EMAILED, available on the Internet or burned to a DVD that can be played on a DVD player.

**Song:** Your song must be a minimum of 2 minutes and a maximum of 5 minutes. You must present all parts of your research and analysis and you must either record your song ahead of time or play it live for the class. If you record your song ahead of time, you are responsible for bringing all technology required to play your song for the class.

**Poster:** Your poster must be at least 12" by 12" and should be on posterboard or cardstock. All parts of your research and analysis must be present on your poster. Your poster must be neat, colorful and creative and include an additional element besides text (ie: scrapbooking embellishment, drawing, ribbons, etc). Spelling and grammar count!

**Booklet:** Your booklet must be a minimum of 6 pages, including a title page. All parts of your research and analysis must be present, and you must have a drawing or picture on each page. Spelling and grammar count and creativity is a must! Your booklet **CANNOT** be on looseleaf paper and must be creatively bound.

Name: \_\_\_\_\_

RAP Final Product Rubric Total Score: \_\_\_\_\_ /60

	Unsatisfactory (0-4)	Satisfactory (5-8)	Outstanding (9-10)	Score
<b>Final Think-Tac-Toe Product (the actual poem, poster, booklet, skit, movie, speech, etc)</b>	Final product does not fulfill the requirements.	Final product somewhat fulfills the requirements.	Final product fully meets all of the requirements.	
<b>Final Product Contents:</b>				
<b>Background Information (Who, Where, When?)</b>	You do not fully explain the background of the concept.	You somewhat explain the background of the concept.	You fully and clearly explain the background of the concept.	
<b>Why?</b>	You do not explain why the concept was discovered or why you are interested.	You somewhat explain the why behind the concept and why you are interested.	You fully explain the why behind the concept and articulate fully and <i>with conviction why you are interested.</i>	
<b>What and How?</b>	You do not explain how the concept works.	You somewhat explain how the concept works.	You fully and completely explain how the concepts work and provide all relevant diagrams, pictures, graphs, formulas, and/or 3D images.	
<b>Evidence of Effort</b>	Project does not demonstrate effort.	Project demonstrates some effort.	Project demonstrates a significant amount of effort.	
<b>Difficulty Level</b>	You chose a mathematical concept that was not new to you and/or did not match your skill level.	You chose a mathematical concept that was new to you and somewhat challenging for you.	You chose a mathematical concept that was new to you and challenged you.	